Factors affecting the oxidative stability of omega-3 emulsions prepared with milk proteins

Horn, Anna Frisenfeldt; Nielsen, Nina Skall; Jacobsen, Charlotte

Publication date:
2012

Document Version
Publisher's PDF, also known as Version of record

Conference abstract (Honored Student Oral presentation)
103rd AOCS Annual Meeting & Expo, April 29-May 2, 2012, Long Beach, California, USA

Factors affecting the oxidative stability of omega-3 emulsions prepared with milk proteins

Anna Frisenfeldt Horn, Nina Skall Nielsen & Charlotte Jacobsen

Division of Industrial Food Research, National Food Institute, Technical University of Denmark, Denmark

Omega-3 fatty acids are prone to lipid oxidation due to their unsaturated nature. In oil-in-water emulsions, lipid oxidation is expected to be initiated at the oil-water interface. The properties of the emulsifier used and the structure at the interface are therefore expected to be of great importance for the resulting oxidation.

This presentation will give an overview of parameters that are expected to change the properties and structure of milk protein components at the interface of 10% fish oil-in-water emulsions. Results from three different studies will be included. The first study compared the effect of two different high pressure homogenizers on oxidation in caseinate and whey protein isolate emulsions. The second study evaluated the effect of homogenization pressure and temperature on emulsions prepared either with whey proteins or a combination of caseinate and β-lactoglobulin. Finally, the third study investigated the influence of pH on emulsions prepared with α-lactalbumin, β-lactoglobulin or a combination of the two. In all three studies the adsorption of individual protein components were shown to be of great importance to lipid oxidation. Thus, the effect of various conditions for emulsion production will be discussed in relation to protein adsorption and their structure at the interface.